

Information and Resources for Vegetable Gardening

Crop Rotation Basics – Vegetable Family Groups

Rotating or moving vegetable “families” from year to year is a “least toxic” method of preventing many bacterial, fungal, pest, nematode, and fertility problems.

These problems build up when crops are grown more than one year in the same spot. It is best to keep “families” together and move them as a group because they share similar pests and nutritional needs. For example, grow tomatoes and peppers together and then move them to another spot. The ideal vegetable garden has four plots in which the crops rotate through year to year. Beans and peas should always be a part of the cycle since they introduce nitrogen back into the soil.

The basic vegetable families most commonly grown are:

- Cucurbits: cucumbers, squash, melons
- Solanacea: tomato, pepper, potato, eggplant
- Legumes: peas and beans
- Cruciferae: broccoli, cauliflower, greens
- All Others: corn, lettuce, beets, spinach

Vegetable Gardening Resources

Vegetable Gardening Resources: Grow Your Own Vegetables, It's Worth It!

<http://camastergardeners.ucdavis.edu/files/63789.pdf>

Vegetable Garden Basics <http://ucanr.org/freepubs/docs/8059.pdf>

Vegetable Gardens How to Plant and Store <http://camastergardeners.ucdavis.edu/files/63784.pdf>

Spring Seed Starting Schedule <http://camastergardeners.ucdavis.edu/files/63767.pdf>

Pests of the Garden and Small Farm: A Grower's Guide to Using Less Pesticide

http://www.ipm.ucdavis.edu/IPMPROJECT/ADS/manual_gardenfarms.html

Integrated Pest Management – Pest Notes

<http://www.ipm.ucdavis.edu/PMG/menu.homegarden.html>

More gardening questions? hotline@uccemg.com or by voicemail at 714-708-1646

This publication is provided as a community service in support of the University of California Division of Agriculture and Natural Resources' (ANR) Strategic Vision by

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Busy Gardener Information and Resource List

UCCE Master Gardeners Contact Information

Website: <http://www.uccemg.com/>

e-mail hotline: hotline@uccemg.com

Telephone questions: (714) 708-1646

Starting Seeds

- Soil-less mix recipe from the Master Gardeners Handbook
 - 4 qts Shredded sphagnum peat moss
 - 4 qts Fine grade vermiculite
 - 1T Superphosphate
 - 2 T Ground Limestone
 - Mix thoroughly
 - Use diluted fertilizer solution when watering

Germination

- Keep moist and warm - 65-70 degrees daytime and 55-60 degrees nighttime
- Grow in light
- Bright window (rotate)
- Two 40 watt fluorescents six inches above seed tray
- "Hardening off" = Outdoors 45-50 degrees

Learn Beneficial Insects:

<http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn74140.html>

Turf: <http://www.ipm.ucdavis.edu/TOOLS/TURF/>

Conservation: Plants, irrigation, rebates, timers and more:

<http://www.bewaterwise.com>

UCCE Websites

Troubleshooting: <http://ipm.ucdavis.edu>

Vegetables: http://vric.ucdavis.edu/main/veg_info.htm

Edible Fruit: <http://homeorchard.ucdavis.edu>

Bookshelf Recommendations

University of California Agriculture and Natural Resources

Buy online <http://anrcatalog.ucdavis.edu/>

California Master Gardeners Handbook

Healthy Roses

Drip Irrigation in the Home Landscape

Pests of Landscape Trees and Shrubs



Ten Tips for Nurturing the Soil

(IPM)

Evaluate your soil

1. Perform a soil test
 - Determine soil type
 - Determine nutrients, pH, salinity
2. Use a soil probe routinely
 - Evaluate soil moisture, texture
 - Evaluate degree of soil compaction
 - Determine root health
 - Evaluate irrigation depth and efficiency

Protect your soil

3. Avoid soil compaction
 - Do not walk on or work in wet soil
4. Prevent soil erosion
 - Adjust irrigation to complement soil type
 - Use living ground covers and mulch
 - Create cover to hold soil in place
 - Improve water penetration to slow runoff
 - Terrace hillsides to retain soil
 - Use porous hardscape to allow water penetration and retention
 - Use berms to control erosion
 - direct water to areas less susceptible to runoff
 - Use infiltration basins to retain water and reduce runoff to ocean

Improve your soil

5. Aerate the soil
 - Use pitchfork or machine
 - Encourages root growth
6. Use raised planter beds
 - Where soil is hardpan or heavy clay

7. Improve soil drainage

- Amend soil to improve soil structure
- Plant on berms to take advantage of improved drainage

Nurture your soil

8. Add compost
 - Mix compost into soil
 - Adds nutrients
 - Improves soil structure
 - Improves air and water movement through soil
 - Adds and sustains microbial life in soil
 - Improves soil health
9. Use mulch
 - Utilize yard waste as mulch or compost
 - Lay mulch on top of soil 2-3 inches deep, but away from base of plants
 - Can use organic or inorganic materials
 - Preserves topsoil
 - Retains soil moisture
 - Suppresses weeds
 - Decreases erosion
10. Fertilize the soil
 - Adds nutrients, especially nitrogen, phosphorous, potassium
 - Also adds micronutrients
 - Organic fertilizers
 - release nutrients more slowly
 - last longer
 - benefit soil
 - less potential for groundwater pollution
 - Synthetic fertilizers
 - fast-acting, short-lived effects
 - Slow-release fertilizers
 - work better in warm, moist soil



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Ten Tips for Integrated Pest Management (IPM)

1. Assess chemicals in your household
 - Make an inventory; keep list current
 - Dispose properly
 - Outdated materials
 - Those with illegible labels or crusted closures
 - Consider less toxic alternatives if necessary
2. Monitor garden regularly
 - Walk through at different times of day
 - Inspect stems, leaves and blossoms
 - Keep a garden notebook to record pest sightings
 - Note plant host, numbers, sketch
 - Learn to identify beneficials and pests
 - Use IPM website for information
 - <http://www.ipm.ucdavis.edu/>
3. Prevent infestation
 - Monitor regularly
 - Use resistant plant materials adapted to Southern California
 - Fertilize and water appropriately
 - Over-fertilization can cause excessive growth, weakening of plant, attract pests
 - Maintain proper plant spacing
 - Good air circulation
4. Enrich the soil
 - Healthy soil promotes healthy plants
 - Add compost to the soil
 - Increases fertility
 - Improves soil structure
 - Use mulch on top of soil
 - Suppresses weeds
 - Retains moisture
5. Learn to accept some damage in the garden
 - Perfection is not required in the garden
 - Caterpillars become butterflies
6. Keep the garden clean
 - Remove sources of food, water, hiding places for pests
7. Encourage natural predators
 - Provide food, water, shelter
 - Beneficial insects
 - Birds
 - Lizards
8. Utilize least toxic mechanical controls first
 - Use a hose to squirt off pests on leaves, stems
 - Pick up and dispose of bugs, snails
 - Trap pests on sticky traps or barriers
9. Utilize least toxic pesticides first
 - Bt against caterpillars
 - Insecticidal soap
 - Horticultural oil
 - Neem oil
 - Pyrethrins
 - Spinosad
10. Use pesticides only if no other control is adequate
 - Use with caution
 - Choose correct pesticide against specific pest
 - Follow label instructions exactly
 - Apply only when no danger to beneficial insects such as bees or to mammals
 - Dispose of pesticide properly



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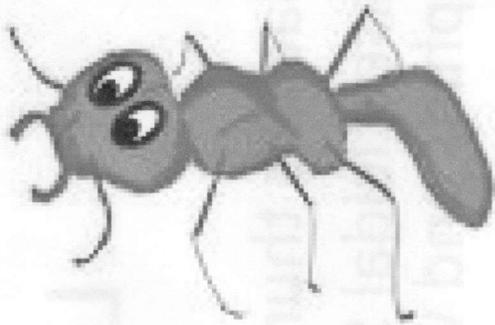
Plant	Companion(s) and Effects
Asparagus	Tomatoes, parsley, basil
Basil	Tomatoes (improves growth & flavor); said to dislike rue; repels flies & mosquitoes
Bean	Potatoes, carrots, cucumbers, cauliflower, cabbage, summer savory, most other veggies & herbs
Bean (bush)	Sunflowers (beans like partial shade, unless you live up north, sunflowers attract birds & bees for pollination), cucumbers (combination of heavy and light feeders), potatoes, corn, celery, summer savory
Bee Balm	Tomatoes (improves growth & flavor).
Beet	Onions, kohlrabi
Borage	Tomatoes (attracts bees, deters tomato worm, improves growth & flavor), squash, strawberries
Cabbage Family (broccoli, brussels sprouts, cabbage, cauliflower, kale, kohlrabi)	Potatoes, celery, dill, chamomile, sage, thyme, mint, pennyroyal, rosemary, lavender, beets, onions; aromatic plants deter cabbage worms
Caraway	Loosens soil; plant here and there
Carrot	Peas, lettuce, chives, onions, leeks, rosemary, sage, tomatoes
Catnip	Plant in borders; protects against flea beetles
Celery	Leeks, tomatoes, bush beans, cauliflower, cabbage
Chamomile	Cabbage, onions
Chervil	Radishes (improves growth & flavor).
Chive	Carrots; plant around base of fruit trees to discourage insects from climbing trunk
Corn	Potatoes, peas, beans, cucumbers, pumpkin, squash
Cucumber	Beans, corn, peas, radishes, sunflowers
Dead Nettle	Potatoes (deters potato bugs)
Dill	Cabbage (improves growth & health), carrots
Eggplant	Beans
Fennel	Most plants are supposed to dislike it.
Flax	Carrots, potatoes
Garlic	Roses & raspberries (deters Japanese beetle); with herbs to enhance their production of essential oils; plant liberally throughout garden to deter pests
Horseradish	Potatoes (deters potato beetle); around plum trees to discourage curculios
Hyssop	Cabbage (deters cabbage moths), grapes; keep away from radishes
Lamb's Quarters	Nutritious edible weeds; allow to grow in modest amounts in the corn
Leek	Onions, celery, carrots
Lemon Balm	Here and there in the garden
Marigold	The workhorse of pest deterrents; keeps soil free of nematodes; discourages many insects; plant freely throughout the garden.
Marjoram	Here and there in the garden
Mint	Cabbage family; tomatoes; deters cabbage moth
Nasturtium	Tomatoes, radish, cabbage, cucumbers; plant under fruit trees; deters aphids & pests of curcurbits
Onion	Beets, strawberries, tomato, lettuce (protects against slugs), beans (protects against ants), summer savory
Parsley	Tomato, asparagus
Pea	Squash (when squash follows peas up trellis), plus grows well with almost any vegetable; adds nitrogen to the soil
Petunia	Protects beans; beneficial throughout garden
Potato	Horseradish, beans, corn, cabbage, marigold, limas, eggplant (as a trap crop for potato beetle)
Pot Marigold	Helps tomato, but plant throughout garden as deterrent to asparagus beetle, tomato

	worm & many other garden pests
Pumpkin	Corn
Radish	Peas, nasturtium, lettuce, cucumbers; a general aid in repelling insects
Rosemary	Carrots, beans, cabbage, sage; deters cabbage moth, bean beetles & carrot fly
Rue	Roses & raspberries; deters Japanese beetle; keep away from basil
Sage	Rosemary, carrots, cabbage, peas, beans; deters some insects
Soybean	Grows with anything; helps everything
Spinach	Strawberries
Squash	Nasturtium, corn
Strawberry	Bush beans, spinach, borage, lettuce (as a border)
Summer Savory	Beans, onions; deters bean beetles
Sunflower	Cucumber
Tansy	Plant under fruit trees; deters pests of roses & raspberries; deters flying insects, also Japanese beetles, striped cucumber beetles, squash bugs; deters ants
Tarragon	Good throughout garden
Thyme	Here and there in garden; deters cabbage worm
Tomato	Chives, onion, parsley, asparagus, marigold, nasturtium, carrot, limas
Valerian	Good anywhere in garden
Wormwood	As a border, keeps animals from the garden
Yarrow	Plant along borders, near paths, near aromatic herbs; enhances essential oil production of herbs

Resource: *The Encyclopedia of Organic Gardening*, J.I. Rodale (editor)

Least Toxic Pesticides

- Bacillus thuringensis (Bt) – controls certain caterpillars
- Insecticidal Soaps – control soft-bodied insects such as aphids and whiteflies
- Pyrethrums - paralyze mosquitoes, flies, thrips, moth larvae, aphids, beetles, mealybugs
- Horticultural oil - controls stationary insects such as aphids and scale
- Spinosad – controls chewing insects: caterpillars, leafminers, thrips
- Neem oil - controls powdery mildew, rust, black spot, aphids, spider mites



ANT BAIT FORMULA

1 tsp powdered boric acid

10 tsp sugar

1 cup water

Mix until all mixture is dissolved

Commercial Baits

Terro (gel) Boric acid + sugar

Pictig (gel) ✓

Drop Ant Kill Gel

Boric acid, sugars, apple + mint